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A CONDENSED ACCOUNT OF SYNTACTIC ANALYSIS OF MANDARIN.

BY- HASHIMOTO, A. Y.

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VARIOUS ASPECTS OF MANDARIN CHINESE GRAMMAR HAVE BEEN EXTENSIVELY EXPLORED WITHIN THE GENERAL FRAMEWORK OF TRANSFORMATIONAL GRAMMAR IN THE PROJECT ON LINGUISTIC ANALYSIS AT OHIO STATE UNIVERSITY. THE PROBLEMS STUDIED INCLUDE SUCH GRAMMATICAL CATEGORIES AS ASPECT MARKERS, ADJECTIVES, EXISTENTIAL AND POSSESSIVE VERBS, INDEFINITE PRONOUNS, AND NUMERALS, AND DIFFERENT SIMPLE AS WELL AS SUCH COMPLEX CONSTRUCTIONS AS RESULTATIVE VERBS, THE BA, THE BEI, THE NEGATIVE, THE COMPARATIVE, THE MODIFYING CLAUSE, THE CONJUNCTION OF NP AND OF VBP, AND THE YES-NO QUESTION AND ANSWER. THE PRESENT PAPER IS A BRIEF SURVEY AND DISCUSSION OF THE RESEARCH WORK DONE SO FAR, IN THE LIGHT OF THE MANY ADVANCES IN THE UNDERSTANDING OF THE FORM OF A TRANSFORMATIONAL GRAMMAR, AS RECENTLY SUMMARIZED BY N. CHOMSKY. THIS ARTICLE APPEARS IN THE OHIO STATE UNIVERSITY RESEARCH FOUNDATION PROJECT ON LINGUISTIC ANALYSIS, REPORT NUMBER 10. (IT)

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Anne Y. Hashimoto
Division of Linguistics

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A. Y. Hashimoto

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0. Introduction This is intended to be a brief survey of research work done in the field of Mandarin grammar on the Project on Linguistic Analysis at the Ohio State University. Since the publication of "Some Syntactic Rules in Mandarin,"[2] which provides a general workable framework for the grammatical description of Mandarin, various aspects of Chinese grammar have begun to be extensively explored. Some of the problems which we attempted to deal with include those of different grammatical categories such as aspect markers, adjectives, existential and possessive verbs, indefinite pronouns, numerals etc., and of diverse simple as well as complex constructions such as resultative verbs, the BA, the BEI, the negative, the comparative, the modifying clause, the conjunction of NP and of VBP, the Yes-No question and answer, etc. The main body of the paper will be devoted to the presentation of the nature and implications of the more significant of these miscellaneous problems.

1. Topics Concerning Grammatical Categories Grammatical categories are here taken to be nonterminal functional classes in the phrase structure part of the base component of the grammar.

1.1 Aspect Markers We are concerned here only with the aspect markers -LE and -GUO, the former expresses roughly the completion of an action, the latter the occurrence of an action at least once. The problem involves certain seeming irregularities in the formation of negative sentences and the so-called A-not-A question. In general, the negative of a simple base sentence is formed by the selection of the negative marker BU preceding the verb phrase, so that the negative counterpart of TĀ MǍI SHŪ[a] is TĀ BÙ MǍI SHŪ.[b] However, when the aspect marker -LE or -GUO is also selected in the base sentence, its negative counterpart does not follow the general pattern.

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[a] He buy book = 'he buys books'.

[b] He not buy book = 'he does not buy books'.

For example, the negative of TĀ MǍI -LE SHŪ[a] is not *TĀ BÙ MǍI -LE SHŪ, but either TĀ MÉI -YǑU MǍI SHŪ or TĀ MÉI MǍI SHŪ;[b] and the negative of TĀ MǍI -GUO SHŪ[c] is not *TĀ BÙ MǍI -GUO SHŪ but TĀ MÉI -YǑU MǍI -GUO SHŪ or TĀ MÉI MǍI -GUO SHŪ.[d] Traditional grammars have generally accepted the irregularities as exceptions. Or, these irregular negative sentences were considered as having complex verb structure, consisting of the negative form of the possessive verb YǑU plus the main verb of the sentence.

The aspect marker in the first case either does not occur or disappears, while that in the other case is retained. The same can be said of the A-not-A questions in which these aspect markers appear. Disjunctive A-not-A questions are formed by the conjoining of two base sentences, matched in every respect except that one contains BU and the other does not. In other words, they are positive-negative counterparts of each other. A general deletion rule then applies to them optionally, allowing any except the left-most element of either verb phrase to be deleted. For example, the conjoined string TĀ MǍI SHŪ BÙ MǍI SHŪ[e] may be deleted into TĀ MǍI SHŪ BÙ MǍI or TĀ MǍI BÙ MǍI SHŪ. If aspect markers co-occur, the conjoined string will be TĀ MǍI -LE SHŪ MÉI-YǑU MǍI SHŪ,[f] which may be contracted into TĀ MǍI -LE SHŪ MÉI-YǑU or TĀ-YǑU MÉI-YǑU MǍI SHŪ[3].

Our solution lies in the identification of the-YǑU form in the negative sentence and the A-not-A question as the suppletive alternant of the aspect marker -LE. Or more specifically -LE is considered as the postverbal alternant of -YǑU. The other aspect marker -GUO is conceived to have the complex form -YǑUGUO; and MÉI is considered to be the alternant of BU before aspect markers.

To make this machinery work, the correct position for positing

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a 'He bought books.'

b 'He did not buy books.'

c 'He has bought books.'

d 'He has not bought any books.'

e 'Is he going to buy books or not?'

f 'Has he bought any books or not?'

the aspect markers in the base component should be before the verb, since the morphophonemic change of the negative marker caused by an immediately following aspect marker holds under all conditions.[4]

It only remains for a few ordered transformational rules to relate these abstract forms to their surface structure. The following T-rules in the order as they are given will produce the desired effect: Deletion of VP elements in A-not-A questions, Transposition of -GUO after the verb it modifies, Morphophonemic change of BU into MÉI when followed by -YǑU, and Deletion of pre-verbal -YǑU after transposition of -GUO on Transformation of -YǑU into -LE to follow the verb it modifies.

With this analysis, the seeming irregularities in negative sentences and A-not-A questions are seen to be regular and simple.

1.2 Adjectives A preliminary study of the general properties of adjectives has been made. The nature of the problem is inherently concerned with the question of subclassification of grammatical categories within the base component.

Adjectives here are taken to be a subclass of verbs, which may be termed descriptive verbs.[5] All adjectives may be modified by emphatic markers such as HĚN, SHÍFEN, etc. This property is not exclusive to adjectives. Other verbs, such as XIÀNG, XǏHUĀN, XĪWÀNG,[a] etc. also share this quality; however, the latter always co-occur with a following NP or S, while adjectives never do. Another property which adjectives share with these verbs is that they can occur freely in the comparative construction, in the positive, comparative or superlative degrees. Adjectives may take a post-verbal descriptive or resultative complement introduced by DE. In this respect, they are similar to verbs like CHĪ, PǍO, KÀN,[b] etc. What distinguishes the adjectives is that they can undergo a transformation which deletes every-

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[a] 'Resemble', 'like', 'hope'.

[b] 'Eat', 'run', 'look at'.

thing except the emphatic marker HĚN in the complement provided that the complement string contains this emphatic marker, and an NP as well as an adjective identical with those in the matrix string respectively. For example: MÈIMEI PIÀOLIÀNG DE MÈIMEI HĚN PIÀOLIÀNG ---→ MÈIMEI PIÀOLIÀNG DE HĚN.[a] Most adjectives may take the aspect marker -LE, and some even take -GUO. Another property characterizing most adjectives is reduplication, which is also possible with other kinds of verbs, but which, in the case of adjectives, is obligatorily followed by the particle DE. Compound adjectives like TÓU-TÉNG, YÓU-QIÁN,[b] etc. are nonreduplicable. Most adjectives can occur in the pronominal modifying clause[6] by means of the particle DE, even after being reduplicated. This latter property seems to be peculiar to adjectives, for other verbs, after being reduplicated, cannot occur in the type of clause mentioned.

In the older framework of the grammar, such properties of adjectives will have to be listed by means of co-occurring formatives, ordered or unordered. Since in general, these properties except for details do not belong to adjectives alone and they do not coincide, there is no possible simple or economical way of listing them so that their co-occurrence restrictions with different kinds of verbs are revealed neatly. This complication is due to the fact that categorization of grammatical categories is presupposed. On the other hand, with the new framework proposed recently by Chomsky, the appearance of a grammatical subcategory such as adjectives in the deep structure will depend entirely on the choice of certain property formatives together with the symbol V. For example, V ---→ ADJ if it is preceded by HĚN and not followed by any postverbal NP etc.; but V ---→ ADJ or V_{intr} if it co-occurs with the reduplicative formative and not followed by any postverbal NP, etc.

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[a] Sister pretty DE very = 'Sister is very pretty".

[b] 'Have a headache', 'rich'.

The same may be said of the subclassification of adjectives. Certain adjectives may take one or more of certain adverbials such as the measure phrase, the duration phrase, indefinite quantifiers,[7] etc. Some adjectives after reduplication may form adverbials, some may not, and some cannot even be reduplicated, etc. To take care of all these by subclassification rules in the PS component is bound to be either unsatisfactory or impossible. However, looking at the same problem with the new concept, adjectives, for example, fall into classes depending on the choice of distictive features relevant for subclassification. For example, ADJ may be rewritten as DUŌ, SHǍO, QIǍO,[a] etc. if it does not co-occur with the feature of reduplication. In this way, much complication and confusion may be eliminated in our attempt to subclassify not only adjectives but any other kind of verbs or grammatical subcategories.

1.3 Others Some work has also been done in examining the distinctive properties of the possessive verb YǑU$_p$ and the existential verb YǑU$_e$, which are homophonous. Some of the differences are: NP after YOU$_e$ must be indefinite but NP after YǑU$_p$ does not fall under this restriction, YǑU$_p$ may take aspect markers but YǑU$_e$ may not (except in If-clause), strings with YǑU$_p$ may be followed by a complement whose object NP is identical with the object NP in the matrix string, or followed by complement introduced by LÁI or QU, but strings with YǑU$_e$ may not, strings with YǑU$_p$ may undergo the object transposition transformation but those with YǑU$_e$ may not, strings with YǑU$_p$ may occur in a pre-nominal modifying clause but those with YǑU$_e$ may not, etc.

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[a] 'many, much', 'little', 'perchance'.

The study of the existential verb is connected with the study of the relationship between indefinite and interrogative pronouns, which are still under investigation. It is probable that the majority of indefinite and interrogative pronouns may be generated from NP containing indefinite or definite determiners. However, further research has to be done before any conclusion may be drawn.

2. Topics Related to Simple and Complex Constructions In the following sections, problems of the deep structure of constructions involving one or two or more strings will be discussed.

2.1 BA and BEI Constructions It has been speculated that transitive verbs, especially those of action and perception such as CHĪ, KÀN-JIAN[a] etc., and certain resultative verbs such as KŪ HÓNG,[b] etc., may occur in a kind of passive construction characterized by the overt passive marker BEI which may take several morphophonemic shapes. Such a construction is the result of a transformation making use of the marker BEI to transpose the original post-verbal NP to an initial position and the original pre-verbal NP to a position after BEI. For example: TĀ CHĪ -LE FÀN[c] ----→ FÀN GĚI TĀ CHĪ -LE.[d] If the verb of the base sentence is reduplicated or co-occurs with either the aspect marker -ZHE or the potential marker DE, it cannot occur in the BEI-sentence.

The BA construction is transformed from a base sentence containing, among other features, transitive verbs of action or of double objects (e.g. GĚI)[e] or certain resultative verbs mentioned above, or middle verbs like ÀI, HÈN[f] etc., by means of the particle BǍ which gives definite reference to the postverbal NP. As a result, the postverbal

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[a] 'See'.

[b] 'Cry red'.

[c] He eat -LE rice = 'he has eaten'.

[d] 'The rice was eaten up by him'.

[e] 'Give'.

[f] 'Love', 'hate'.

NP is switched to a preverbal position. For example: TĀ CHĪ -LE FÀN ----→ TĀ BǍ FÀN CHĪ -LE.[a] Other restrictions on the BA sentence are as follows: the verb may not co-occur with the potential marker DE, the VP of a BA sentence must be modified in some way, for example, either the verb must take aspect markers or a resultative complement, or the object NP must be followed by a postverbal DE-complement or a frequency phrase, etc.

It is desirable that the deep structure of the underlying string of either the BEI or the BA construction contains the formative BEI or BA respectively. This is, however, not possible within the older framework of the grammar if resultative verbs are to be generated from double-based strings. The reason is that certain resultative verbs which are the combination of intransitive verbs or adjectives may undergo the BA or the BEI transformations, despite the fact that simple intransitive verbs or adjectives may not. For example, TĀ BǍ HÓULONG HÀN YǍ LE[b] or YǍNJING GĚI TĀ KŪ HÓNG LE[c] is perfectly grammatical. If the BA and BEI formatives never co-occur with such simple verbs, this special kind of resultative verbs will also be excluded from the BA and BEI transformations, for which they are eligible. Moreover, resultative verbs which are combinations of verbs eligible for such transformations, but are generated from strings with identical pre-verbal NP's are ineligible for the same transformations, while similar type of resultative verbs generated from strings with preverbal vs. postverbal identification are fully qualified for the said transformations. Even if the BA and BEI formatives were to be introduced by transformations, the older framework simply could not handle these res-

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[a] 'He has eaten the rice'.

[b] He BA throat cry sore LE = 'He cried to such effect that his throat was sore'.

[c] Eyes GEI he cry red LE = 'His eyes were red as a result of crying'.

trictions.[8]

These difficulties are eliminated when we adopt the new framework and include the BA and the BEI formatives in the deep structure. The first case can be handled simply by allowing resultative verbs composed of intransitive verbs or adjectives co-occurring with BA or BEI, to go through the transformations concerned, but filtering out simple intransitive verbs or adjectives co-occurring with the same formative from such transformations. The other case can be taken care of by the fact that certain deep structures are required as conditions for the operation of the transformations.

2.2 The Negative The negative construction as yet remains a problem to be further investigated. We will outline the problem below and discuss the difficulties involved in solving it.

Any affirmative sentence may be negated by employing a form of the negative marker BU. BU assumes different shapes under different morphophonemic environments. For example, BU followed by the imperative YÀO[a] may be contracted to BIÉ. This contraction is often found in negative imperative sentences. For example: NǏ BIÉ QÙ[b] comes from NǏ BÙ YÀO QÙ. A contraction must take place if BU is followed by YǑU, whether the latter be an aspect marker, a verb or a comparative marker. That is, BÙ YǑU > MÉI YǑU, already mentioned in the discussion of aspect markers. A different situation occurs when BU occurs with the potential marker DE, either modifying resultative verbs or compound verbs like MÁN-GUO, ZHǏ-ZHÙ[c] etc. BU then comes in between the two members of either combination and DE is reduced to zero, for example: BÙ DE CHĪ BǍO ----→ CHĪ BÙ BǍO.[d] This change is also mandatory.

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[a] 'Must, have to'.

[b] 'Don't go!'

[c] 'Deceive', 'stop'.

[d] Eat not full = 'cannot eat to satisfaction'.

The examples given above only show BU occurring with verbs. However, the negative marker can also occur before AUX (auxiliaries: such as NÉNG or NÉNGGOU, GǍN, KĚN, HUÌ, DĚI, KĚYǏ,[a] etc), and certain ADV (adverbs: such as KĚNÉNG, YĪNGGĀI, HUÌ, HĚN, ZÀI, YĪDÌNG,[b]...). This is the central point of the problem. It is not feasible to introduce BU by the negative transformation, for then the transformation will perform something undesirable, namely, change the meaning of the sentence according to the position of BU. Since semantic rules will not read transformed structures, there is no way to handle this change of meaning. We believe the correct alternative is to provide for a negative formative within the deep structure. Shall we then posit three negative markers at three different places in the deep structure? A sentence containing three BU's, such as TĀ BÙ YĪDÌNG BÙ GǍN BÙ LÁI[c] is perfectly grammatical.[9] A possible solution is to consider certain negative markers as derivational, since BU occurring before AUX or ADV may not be intervened by other elements, whereas BU occurring before a verb is transportable. Some examples of the latter case are seen in the negative of the BA and the BEI sentences. BU occurs only before BA and BEI and never after them. This can be explained most simply by saying that the BU is transported from a position before the verb of such strings. However, to call the BU in front of AUX or ADV as derivational does not really solve the problem, but simply postpones it to that part of the grammar which handles word

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[a] 'Can', 'dare', 'willing to', 'will', 'have to', 'may'.

[b] 'Probably', 'should', 'probably', 'very', 'again', 'certain'.

[c] He not certain not dare not come = 'It is not certain that he dare not refrain from coming'. (Since there is no parallel construction in English, the meaning is roughly translated only.)

formation. At present, we tentatively accept the solution of positing three negative markers in the deep structure.

Before passing, it may be mentioned that adverbs which occur only in the negative form, for example: BÙ-DÀ, BÙ-BĪ, BÙ-YÒNG[a] etc. will be considered as compounds, and not as syntactic combinations of the negative marker and the following bound form. Some adverbs, such as CÓNGLÁI[b] etc. always occur in negative sentences. And finally, BU is found to be exclusive with the final particle LE, for example, *MÉI QÙ LE[c] is ungrammatical.

2.3 Resultative Verbs Resultative verbs are generally considered to consist of a verbal component followed by a resultative or directional complement, for example: CHĪ BǍO, PǍO SHÀNGLAI[d] etc. The complement contains either a verb or a verb plus directional markers. These resultative verbs behave in some respects like simple verbs: for example, they may occur with aspect markers or a negative marker. They differ from simple verbs in that they cannot be reduplicated, they do not take DE-complement, and they can freely form the potential mode by means of the potential marker DE in a peculiar way. The potential marker, either in its positive or negative form comes between the two members of resultative verbs. This makes them similar to compound verbs like ZHǍO-ZHÁO[e] which may be derived originally from resultative verb formation.

The form of the resultative verbs looks very simple. However, their formation is by no means simple and uniform. Let us examine resultative verbs with resultative complements. The first component usually consists of transitive verbs of action, certain types of intransitive verbs or adjectives. In relation to the BA and BEI constructions, it has already been pointed out that resultative verbs with resultative

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a 'Not so much', 'not necessary', 'needless'.

b 'Ever'.

c *Not go LE.

d 'Eat full", 'run up'.

e 'Find'.

complements almost identical in shape, behave differently with respect to these transformations. If we take the formation of these resultative verbs to be simply the combination of two verbs in the deep structure, such fact cannot be explained. On the other hand, if we regard the complement verb to be derived from another string, such fact can be explained most revealingly by noting the difference between the string underlying the complement and that underlying the first component. If the object of one string is identical with the subject of the other string, or the subject of one string is part of the subject of the other string,[10] the resultative verbs formed from these strings are eligible for both the BA and the BEI transformations. If the subjects of the two underlying sentences are identical, the resultative verbs so formed may only have the BA transformation.

Resultative verbs having the directional complement also vary, depending on the first component, which contains either certain kinds of transitive verbs of action or intransitive verbs of action. The directional complement consists of a motion verb (such as SHÀNG, XIÀ, JÌN, CHŪ, HUÍ, GUÒ, QǏ)[a] and a DIR (directional marker: LÁI or QU).[b] When the first component contains an intransitive verb of action, the aspect marker, if chosen, will follow it and precede the complement, for example: PǍO -LE SHÀNG QU.[c] Otherwise, the aspect marker will occur either after the first verb or the directional marker, for example: NÁ -LE CHŪ LAI YĪ BĚN SHŪ or NÁ CHŪ LÁI -LE YĪ BĚN SHŪ.[d] Since this fact can be easily handled as a selectional condition of the transformation which will determine the location of the aspects, and since there is no compelling reason to regard this type of resultative verb

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[a] 'Ascend', 'descend', 'enter', 'exit', 'return', 'cross', 'arise'.

[b] 'Towards', 'away from'.

[c] 'Ran up'.

[d] 'Drew out a book'.

as being derived from two strings, the complement in the deep structure will not be rewritten as S, but only as motion verb plus directional marker. Moreover, there are difficulties involved in deriving the directional complement from a sentence when the object in the matrix string is inanimate. To say that SHŪ CHŪ LAI[a] is the underlying sentence of the directional complement in TĀ NÁ CHŪ LAI SHŪ, will compel us to accept the former sentence as grammatical. If the nonoccurrence of inanimate nonmovable nouns with motion verbs is considered as a grammatical problem, as we think it is, we would certainly like to exclude such sentences as SHŪ CHŪ LAI.

There are resultative verbs which occur only in the potential form, for example: DUÌ BÙ QǏ, MÀI DE QǏ[b] etc. Not much has been done about them, and they remain a further problem to be solved.

2.4 The Comparative Here we will be concerned with the positive and comparative degrees of comparison only. The former construction is characterized by the presence of GĒN...YÌYÀNG or YǑU...NÀME, differing slightly in meaning only. The latter construction is distinguished by the presence of the particle BǏ. Henceforth they will be referred to as the comparative, since except for a few minor points, they are very similar in structure.

Several problems arise. First of all, is the comparative essentially a simple construction or is it a complex one? If it is the latter, there is a further question as to whether it is a conjoining or an embedding structure. Let us consider the first possibility. In this view, a sentence like TĀ BǏ WǑ GĀO[c] is seen as simply containing a comparative phrase BI+NP. The advantage of this solution lies in the fact that we do not have to posit such semantically weird underlying strings as TĀ GĀO and WǑ GĀO for the comparative, since the implica-

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[a] Book come out.

[b] 'Sorry', 'can afford to buy'.

[c] He BI I tall = 'He is taller than me'.

tions of the simple sentences do not match that of the comparative sentence as a whole. It can also avoid the problem of the negative --- thus, the negative occurs only before BI. However, there are some serious handicaps if we accept this solution. Certain restrictions on the two NP's compared cannot be stated: the NP's must be matched in construction, they must both be NP's, or VP's or S's. Since our PS-grammar will be context free, there is no way to handle this kind of parallelism within a simple construction. A more serious problem is that certain insights into the matching of NP's will not be revealed. A sentence like *TĀ BǏ YĪNYUÈ GĀO,[a] which is ungrammatical, will not be blocked. Furthermore, the reason that this sentence is ungrammatical will not be evident.

Neither does it seem satisfactory to posit the comparative as derived from two conjoined sentences. In general, conjunction takes place in Mandarin when there are identical or parallel NP's or VP's in the sentences in question. It is hardly conceivable that TĀ BǏ WǑ GĀO WǓ CÙN[b] is derived from the conjunction of TĀ GĀO WǓ CÙN and WǑ GĀO WǓ CÙN.

Let us now examine our last alternative: that the comparative is derived from the embedding of one string into another. Let us tentatively consider S to be rewritten as NP+VBP (SADV) where SADV represents sentence adverbials such as Time Phrase or Locative Phrase which can be freely switched to an initial position. VBP will then be rewritten as (BU) VP. The VP of the matrix string of the comparative will consist of a comparative formative, followed by V. The comparative formative consists of BI plus a sentence, followed option-

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[a] *He BI music tall.

[b] He BI I tall five inch = 'He is five inches taller than me'.

ally by adverbs which can occur with the comparative.

Adjectives, middle verbs such as XIHUAN[a] etc, or quality verbs such as XIANG,[b] can freely occur in the comparative. Certain other kinds of verbs such as transitive or intransitive verbs, double-object verbs, telescoping verbs, quotative verbs etc. can occur in the comparative only if they are modified by certain adverbs such as XIAN, ZAO, DUO[c] etc.[11] It is therefore justified to consider these adverbs as part of the elements of the comparative formative.

Degree adverbials such as WU CUN etc. occurring in the comparative come from the matrix string only. The conditions we have to state in the comparative transformation are only two: let S_1 = matrix string, S_2 = embedded string. The VBP of S_2 must equal either V_1 or $V_1 + NP_1$ in S_1 (that is, S_2 may not contain BU or degree adverbials etc); if $S_2 = NP_2 + VP_2$, then NP_2 may not be the same as the preverbal NP_1 in S_1. If only condition 1 is met, sentences like WO JINTIAN BI TA ZUOTIAN MANG[d] may be generated. If both conditions are met, only sentences like TA BI WO GAO WU CUN are generated. In other words, condition 1 will allow the comparison of Time Phrase as illustrated and Locative Phrase.[12]

With this interpretation of the formation of the comparative, it is very easy to explain why *TA BI YINYUE GAO is ungrammatical: simply because the sentence *YINYUE GAO will not be generated by the grammar.

In explaining the semantic implication underlying strings of the comparative sentences, as well as strings of other embedding con-

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[a] 'Like'.

[b] 'Resemble'.

[c] 'First', 'early', 'more'.

[d] I to-day BI he yesterday busy = 'I am busier today than he was yesterday'.

structions to be discussed in the following section, it is very important to take into consideration the following nature of the semantic rules: namely, they will interpret a simple sentence TA GAO differently from the same one embedded into the comparative and dominated by the comparative formative;[13] similarly, they will distinguish a simple sentence TA WU CUN GAO[a] from one which is exactly the same except that it contains the comparative formative. It is on this basis that we find our positing of sentences underlying the comparative acceptable and satisfactory.

Examples have been given for the comparative degree, but the same can be said of the positive degree. The only difference is that with the positive degree, verbs other than adjectives or middle verbs or quality verbs may not occur, and the comparative formative will not include degree adverbs.

2.5 Pre-Nominal Modifying Clause The term Pre-Nominal Modifying Clause signifies those modifying elements occurring before a nominal by means of the particle DE, which can be traced to have been derived from a clause or a sentence. There are several interesting problems related to this Pre-Nom Mod clause, namely, the types of Pre-Nom Mod clauses, the formulation of PS- and T- rules for it, pronominalization and interrogation in connection with it, etc. These will be discussed below.

There seem to be two types of Pre-Nom Mod clauses(henceforth abbreviated as Mod clauses). One type must contain a Nom identical with the Nom it modifies in the matrix sentence. For example, the Mod clause of DÀI YǓANJÌNG DE HÁIZI LÁI LE[b] is from HÁIZI DÀI YǓANJÌNG in

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[a] 'He is five inches tall.'

[b] Wear glasses DE child come LE = 'the child who wears glasses has come,' or 'children who wear glasses have come'.

which HÁIZI is the shared Nom. This type will be referred to as the shared-Nom type, which will be our main concern. In the other type, this condition is unnecessary: it will be referred to as the non-shared Nom type. The latter is limited to clauses which modify certain abstract nouns such as SHÌQING, WÈNTÍ, XIÀNXIÀNG, YUÁNYĪN, SHÍHÒU[a] etc. For example, the Mod clause of a sentence like WǑ BÙ ZHĪDÀO NǏMEN CHǍOJIĀ DE SHÌQING[b] simply has as its underlying sentence: NǏMEN CHǍOJIĀ. It is possible to posit a shared Nom in the underlying sentence, such as: SHÌQING SHÌ NǏMEN CHǍOJIĀ.[c] It means that the base form itself has to be derived from an embedded sentence having the form SHÌQING+SHÌ+C, where C is rewritten as S, in this case: NǏMEN CHǍOJIĀ. To employ so much machinery in order to make the Mod clause uniform does not seem feasible. Moreover, this type never has pronominalization, as distinct from the shared-Nom type.

Needless to say, the Mod clause is a subordinate structure embedded into the matrix sentence in which there is a Nom which the former modifies. MOD, the formative for Mod clause, will be an optional element following the Nom it modifies, both dominated by NP, that is, NP ----→ Nom (MOD). Nom will be rewritten as (DET) N, where DET ----→ (D)(Num) Cl[14]; and MOD as S+DE (DET= determiners; D = demonstratives like ZHÈ, NÀ;[d] Num = numerals; Cl = classifiers). The position where the Mod clause actually occurs is either before or after the determiners of the Nom it modifies, with different significance. Since the condition for the share-Nom type Mod clause is concerned with both the determiners and nouns, the choice of the position for the MOD formative is either before or after Nom. If a Mod clause occurs in front of numerals only, the resultant string is ungrammatical, as in *DÀI YǍNJÌNG DE YĪ GE HÁIZI,[e] for pre-determiner Mod clause gives definite reference and is therefore incompatible with indefinite nominals. Moreover, if the MOD formative is placed in front of DET, it

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[a] 'Matter', 'problem', 'phenomenon', 'cause', 'time'.

[b] I not know you quarrel DE matter = 'I don't know about your quarrel'.

[c] Matter is you quarrel = 'the matter is you quarrel'.

[d] 'This', 'that'.

[e] *Wear glasses DE one GE child.

suggests that the other possible construction, which gives purely descriptive reference, is derived from the construction resulted from this arrangement. It is therefore feasible to position the MOD formative after Nom. Later a permutation rule will put MOD in the correct position in accordance with the structure of the modified Nom.

When two or more Mod clauses modify one Nom, it is either the result of conjunction of Mod clauses modifying the same Nom, or the effect of a Mod clause modifying a Nom already modified by one or more Mod clauses, so that no iterative or recursive device need be built into the PS-rule.

There are certain restrictions with regard to both the Mod clause and the modified Nom. Pronouns and proper names generally do not take Mod clause. The Mod clause may not end with final particles, nor can it contain verbs like SHÌ,[a] or certain adjectives, etc.[15] It may be a complex sentence. Moreover, the shared-Nom may be in the subordinate clause, for example: TĀMEN ZÀI TÁN WǑ YĪ KÀN JÌU KŪ DE DIÀNYǏNG,[b] the Mod clause being derived from: WǑ YĪ KÀN DIÀNYǏNG JÌU KŪ. On the other hand, the shared-Nom may not be dominated by more than one MOD formative at the time when the MOD transformation will apply, unless it is in the possessive. That is, we cannot make a Mod clause out of a Nom in a Mod clause, with only one exception: for example, WǑ PÈNGJIAN TĀ DE NǙER DE NÈI GE RÉN LÁI LE,[c] where TĀ is NÈI GE RÉN pronominalized, and it itself occurs in a Mod clause, namely, NÈI GE RÉN YǑU NǙER.

There are interesting facts concerning the shared-Nom of the Mod clause in connection with pronominalization, provided that the former consists of human nouns. It may not be pronominalized if the Mod clause either

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[a] 'To be'.

[b] They ZAI talk I whenever see then cry DE movie = 'they are talking about the movie, which whenever I see it, I cry'. (This construction is not paralleled in English, so that the translation is clumsy. Same with the following examples.)

[c] I meet he DE daughter DE that GE person come LE = 'the person, whose daughter I met, has come'.

begins or ends with it. This will exclude ungrammatical sentences like *TĀ DÀI YǍNJÌNG DE HÁIZI LÁI LE,[a] or *MĀMA XǏHUĀN TĀ DE HÁIZI LÁI LE.[b] Pronominalization is obligatory if the said shared-Nom is immediately preceded by particles like GĒN, BǏ, BǍ, BÈI, ZÀI, CÓNG, XIÀNG, WÀNG etc., or if the shared-Nom is dominated by more than two MOD's in accordance with the condition stated above. Examples are: NǏ BǏ TĀ GĀO DE NÈI GE RÉN SHÌ SHÉI,[c] TĀ ZÀI NÀR CHĪ FÀN DE CÀIGUǍN HĚN DÀ[d] (Mod clause derived from: TĀ ZÀI CÀIGUǍN LI CHĪ FÀN), ZHÈ JUÌ SHÌ WǑ SHUŌ TĀ DE FÁNGZI GĚI HUǑ SHĀODIÀO DE RÉN,[e] etc. Other than these cases, pronominalization is optional.

It is clear that the MOD Transformation, which permutes eligible Mod clauses to the right position, has to state the order of permutation, for as we climb up trees from the bottom, erasing boundary markers, etc., a Nom may be followed by more than one Mod clause. In that case, lower order Mod clauses should be permuted first, even if they are contained in higher Mod clauses, then higher order Mod clauses will be placed in front of the already permuted Mod clauses.[16]

The pronominalization rule and the rule for the deletion of repeated elements will be general ones, which cover not only this case but also many other cases of embedding or conjoining structure. Needless to say, the former rule should precede the latter.

Finally, it has been found out that any nonpronominalized Nom of the Mod clause may be interrogated; however, the modified Nom may not.

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[a] *He wear glasses DE child come LE.

[b] *Mother like he DE child come LE.

[c] You BI he tall DE that GE person be who = 'Who is the person than whom you are taller?'

[d] He locate there eat rice DE restaurant very big = 'the restaurant where he ate is very big'.

[e] This JUI be I say he DE house GEI fire burn up DE person = 'this is the person I said his house was burnt up'.

For example: TĀ XǏHUĀN DE HÁIZI LÁI LE[a] ----→ SHÉI XǏHUĀN DE HÁIZI LÁI LE,[b] but not ----→ *TĀ XǏHUĀN DE SHÉI LÁI LE,[c] at least not in colloquial speech. Interrogation of determiners alone are not counted here, as for example: TĀ XǏHUĀN DE SHÉNME HÁIZI LÁI LE[d] is grammatical.

2.6 Conjoining of NP and of VBP There are two major types of conjoining possible in Mandarin, namely, NP conjoining and VBP conjoining, since each base sentence consists of an NP followed by a VBP. To provide for the possibility of unlimited conjoining, the following schema may be used: S ----→ $\left\{ S^n + \text{cjn},\ \text{cjv} + S^n \right\}$ where cjn stands for conjunction for NP's and cjv for conjunction for VBP's.

Given two or more sentences, if there is a match in the VBP's that is, if all the corresponding nodes dominating the VBP's are identical, the NP's may be conjoined upon deletion of all the VBP's except the last one. The cjn, which includes conjunctions like QUÁN, DŌU[e] etc., is transported to a position immediately preceding the preserved VBP. For example: ZHĀNG XIĀNSHENG LÁI + LǏ XIĀNSHENG LÁI + CHÉN XIĀNSHENG LÁI + DŌU ----→ ZHĀNG XIĀNSHENG LǏ XIĀNSHENG CHÉN XIĀNSHENG DŌU LÁI[f]. If the match is in the NP's the VBP's may be conjoined, this time upon deletion of all NP's but the first one. The cjv, which may be YÒU, YĚ[g], Ø, etc., is reduplicated and distributed among each of the VBP's. For example: YÒU + TĀ HUÌ DǍ ZÌ + TĀ HUÌ HUĀ HUÀR ----→ TĀ YÒU HUÌ DǍ ZÌ YÒU HUÌ HUĀ HUÀR[h] or TĀ HUÌ DǍ ZÌ HUÌ HUĀ HUÀR.

The main finding of the study of these two kinds of conjoining is the discovery of a set of principles which determine the constituent structure of the surface P-markers as they are derived from the deep P-markers in such kind of conjoining. There are three major steps involved.

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a He like DE child come LE = 'the child he likes came'.

b Who like DE child come LE = (nontranslatable into English)

c *He like DE who come LE.

d He like DE what child come LE = (nontranslatable into English)

e 'All'.

f Zhang Esq. Li Esq. Chen Esq. all come = 'Mr. Zhang, Mr. Li and Mr. Chen all came'.

g 'Also'.

h He also can type word also can draw picture = 'He can type as well as draw'.

First of all, we take the constituent closest to the conjunction and move it in the direction of the latter. The two are permuted if they share the same node. This is called "reattachment". Next, all other matched constituents (one less than total of the matched constituents), which are supposed to be marked, must be deleted. The S symbols now dominating only NP's or VBP's will be relabelled with the same symbol as that of the only node it directly dominates. This is "deletion and relabelling". Finally, all the matched constituents are grouped together and dominated by their shared label. This is "grouping". It is interesting to notice that the NP reattachment goes exactly in the opposite direction from the VBP reattachment.

The match in VBP can be a match in one or more of the following: AUX(auxiliaries), V, DET, etc. For example: TĀ YÀO MǍI YĪXIE QIĀNBǏ + TĀ YÀO MǍI YĪXIE MÁOBǏ ----→ TĀ YÀO MǍI YĪXIE QIĀNBǏ MÁOBǏ[a] after all deletions have taken place.

There are a few exceptions to these principles. In the case of disjunctive questions, there is an obvious match of VBP; however, deletion of the matched constituent is not permissible. For example: NǏ GĀO TĀ GĀO[b] but not *NǏ GĀO TĀ or *NǏ TĀ GĀO. Another case is the A-not-A question, containing an affirmative and its corresponding negative VP, which involves multiple possibilities of deletion. Deletion may take place from either the affirmative or the negative VP. For example, TĀ YÀO MǍI SHŪ + TĀ BÙ YÀO MǍI SHŪ ----→ TĀ YÀO BÙ YÀO MǍI SHŪ or TĀ YÀO MǍI SHŪ BÙ YÀO.[c]

2.7 Others Some investigation has also been made into the nature of the close relationship between certain sentences. Since the study of structure beyond the limit of a sentence has barely begun, our attempts

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[a] He want buy some pencil brush = 'he wants to buy some pencils and brushes'.

[b] You tall he tall = 'Are you taller or is he taller?'

[c] He want not want buy book
He want buy book not want } = 'does he want to buy books?'

have brought forth some interesting points but have not been able to work out satisfactory solutions. An interesting example is the relation between Yes-No questions and answers with tags. Yes-No questions are sentences in either the affirmative or negative ending with questions particles like MA, BA, etc. The tags are of two forms: the affirmative is SHÌ[a] or any of its morphophonemic form, and the negative is BÙ SHÌ[b] or any of its alternants.[17] The answers to these questions may also be affirmative or negative sentences. It is found out that through the combination of tags and answers, the questions are predictable. If the tags and the answers agree in sign, that is, simultaneously affirmative or negative, the questions will also be of the same form, that is affirmative or negative respectively. For example: from SHÌ + WǑ QÙ[c] or BÙ + WǑ BÙ QÙ,[d] the question NǏ QÙ MA[e] can be predicted. On the other hand, if the tags and the answers disagree in form, that is, one is affirmative, while the other is negative, the questions will be in the negative. For example: from SHÌ + WǑ BÙ QÙ[f] or BÙ + WǑ QÙ[g] we can predict the question NǏ BÙ QÙ MA.[h] It seems, therefore, possible to generate Yes-No questions from the combination of given tags and answers. However, the idea of regarding a tag plus answer as a base sentence seems to be counter-intuitive and needs more consideration. Exactly how this interesting relation is to be handled is still under research.

3. Prospective Since the many advances in our understanding of the form of a transformational grammar, as recently summarized by N. Chomsky, many

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a 'Yes'.

b 'No'.

c 'Yes, I am going.'

d 'No, I am not going.'

e 'Are you going?'

f 'That's right, I am not going.'

g 'That's not right, I am going.'

h 'Are you not going?'

of the problems and difficulties we encountered earlier in dealing with different aspects of Mandarin grammar seem to have come to light. Since these problems are interrelated, as the structures of a language are, the investigation of one naturally sheds light upon others. It remains for us to engage our future efforts to incorporate the ideas developed so far into a more integrated description.

FOOTNOTES

[1]I would like to express my thanks to William S-Y. Wang and Sandra Annear for helping me to prepare this paper and for their valuable suggestions.

[2]W. S-Y. Wang, POLA Report No. 3r, pp. 32-53; also Proceedings of the Ninth International Congress of Linguists, pp. 390-401.

[3]This last example is rejected as deviant by Northern Mandarin speakers of the older generation. However, in recent linguistics publications of Peking, this construction has often been cited, e.g., in Dīng, Shēng-Shù et al., Xiàndài Hànyǔ Yǔfǎ Jiǎnghuà (Peking, 1961, p. 206) This means that it has come into current use.

[4]As for example when the verb and the negative marker is interrupted by a series of elements: for example, TĀ CÓNGLAI MÉI -YǑU GĀOGAOXÌNGXING DÀDA-FĀNGFANG DE MǍI -GUO SHŪ,[a] in which -YǑU is obligatorily switched to a position immediately following the negative marker.

[5]In adopting the term "Adjectives," we follow the terminology of Y-R. Chao.

[6]See section 2.5 below.

[7]Examples of measure phrase, duration phrase, and indefinite quantifiers are WǓ CÙN, LIǍNG NIÁN, YĪDIǍR[b] respectively.

[8]For example, it can only be stated as a footnote in the transformation involved that certain resultative verbs generated from a certain resultative transformation are not eligible for the BEI transformation, etc.

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[a] He ever not -YOU gladly generously buy -GUO book = 'he has never gladly and generously bought books'.

[b] 'Five inches', 'two years', 'a little'.

[9]Sentences with more than three negative markers are of complex construction. For example: WǑ BÙ SHÌ BÙ ZHĪDÀO NǏ BÙ JIÀNDE BÙ YUÀNYI BÙ QÙ[a] is derived from WǑ BÙ SHÌ + C where C ---→ WǑ BÙ ZHĪDÀO + C' where C' ---→ NǏ BÙ JIÀNDE BÙ YUÀNYI + C" where C" ---→ NǏ BÙ QÙ.

[10]The latter case occurs when one of the subject nominals is in the possessive, as when we have TĀ as subject in one string and TĀ DE YǍNJÌNG[b] as subject in the other.

[11]For example: *TĀ BǏ WǑ CHĪ FÀN is ungrammatical, but TĀ BǏ WǑ XIĀN CHĪ FÀN[c] is fully grammatical.

[12]For example: TĀ ZÀI JIĀLI BǏ ZÀI XUÉXIÀOLI HÚNÀO.[d]

[13]See C. J. Fillmore's "Entailment Rules in a Semantic Theory," paper read before the 1964 International Symposium on Signs and Systems of Language.

[14]Crossed brackets signify the obligatory choice of one or more of the elements within the brackets chained.

[15]Restrictions in connection with other kinds of verbs will not be pursued here. Adjectives like DUŌ, SHǍO, GÒU, QUĒFÁ[e] etc. do not occur in a Mod clause. *DUŌ DE RÉN...etc. is ungrammatical.

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a I not be not know you not JIANDE not willing not go = 'It is not that I don't know that it is not the case that you are not willing not to go'.

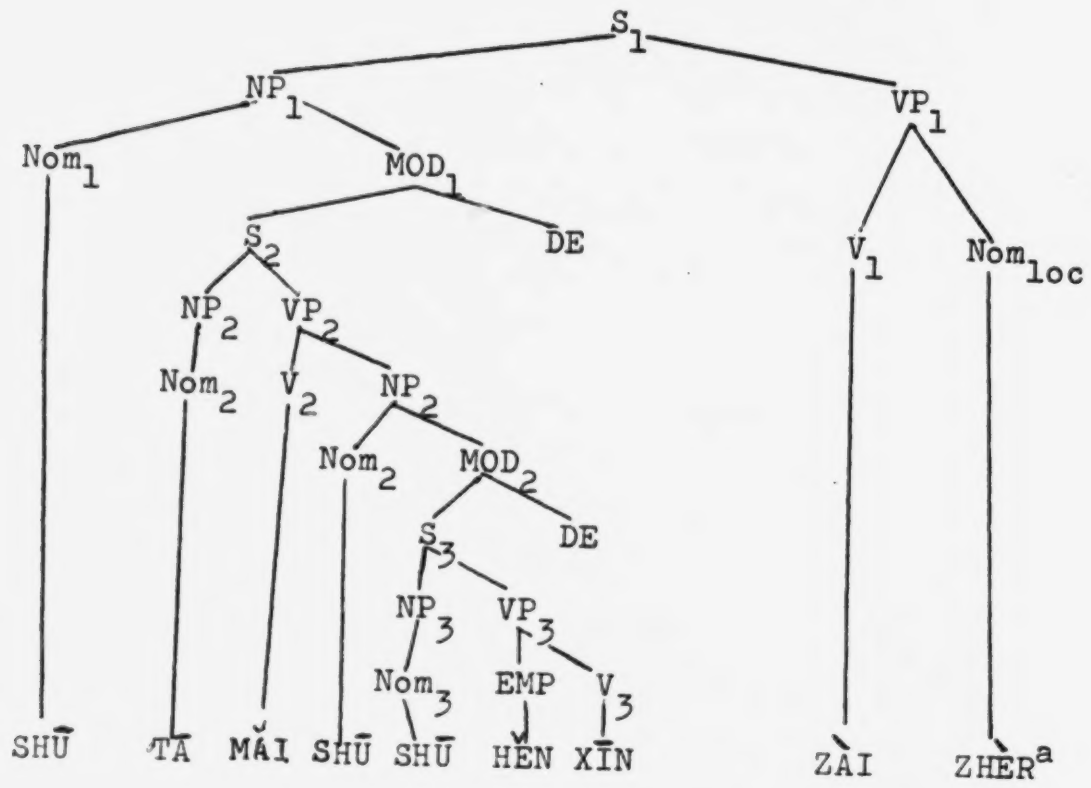
b He DE glasses = 'his glasses'.

c He BI I first eat rice = 'he ate before me'.

d He at home BI in school naughty = 'he is naughtier at home than in school'.

e 'Much', 'little', 'enough', 'insufficient'.

[16] The following example may illustrate the point. Minimum tree structure is used.



MOD_2 is included in MOD_1 as shown by the tree. The former should be permuted before the latter by the following rule:

$$\frac{X\ DET}{1}\quad\frac{(MOD)^n\ N}{2}\quad\frac{MOD^n}{3}\quad\frac{Y}{4}\ \Longrightarrow\quad 1\ 3\ 2\ 4$$

with the provision that lower order MOD, MOD_2 in this case, should be permuted first.

[17] An alternative form of SHÌ is SHÌ DE, and of BÙ, SHÌ is BÙ SHÌ DE.

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[a] Book he buy book book very new locate here.

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